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Griffith

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(54) **WIRELESS TELEPHONE AS A TRANSACTION DEVICE**

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(73) Assignee: **Avaya Technology Corp.**, Basking Ridge, NJ (US)

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This patent is subject to a terminal disclaimer.

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(52) **U.S. Cl.** **455/406**; 455/411; 455/414
(58) **Field of Search** 455/406, 407, 455/408, 403, 410, 411, 414, 415, 422, 426; 235/383; 705/44.26

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Assistant Examiner—Philip J. Sobutka
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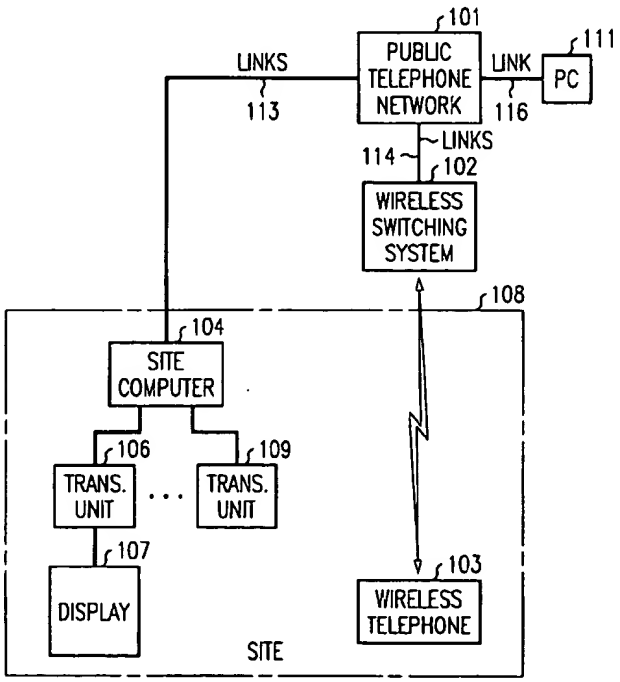
(57) **ABSTRACT**

Utilizing a wireless telephone functioning as a transaction device. The wireless telephone places a call to a site computer controlling a transaction unit. For example, the transaction unit may be a cash register at a supermarket. The wireless telephone then transfers to the transaction unit account information specifying the type of account against which the transaction is to be billed and identification of that transaction. The site computer controlling the transaction unit responds with a transaction number which is transmitted to the transaction unit and wireless telephone. The user of the wireless telephone then confirms the transaction when the correct transaction number is displayed on the transaction unit. After the transaction is completed, the site computer controlling the transaction unit transmits the data defining the transaction to the wireless telephone which stores this information in a database associated with the account against which the transaction was charged. In a second embodiment, the transaction number is not visually displayed but rather is transmitted over a second transmission media to the wireless telephone confirming that the correct transaction is taking place.

34 Claims, 12 Drawing Sheets



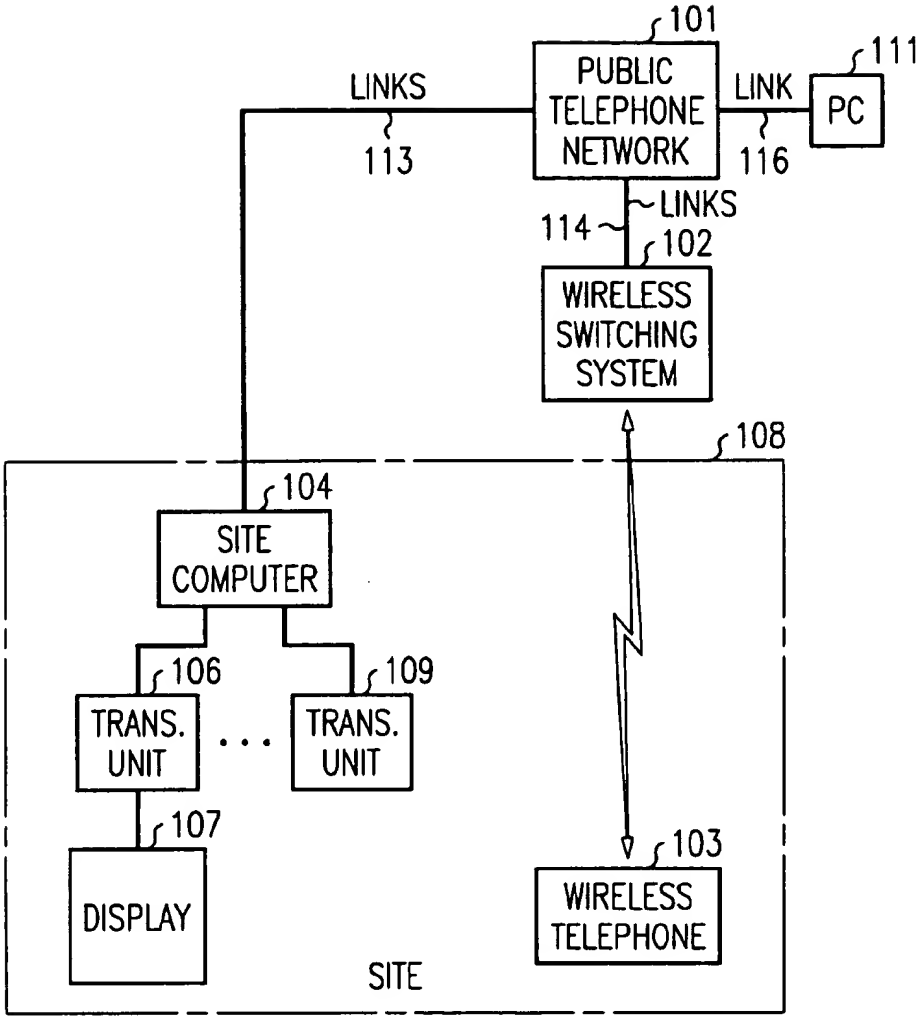

101
PUBLIC TELEPHONE NETWORK
111
PC
LINKS
113
LINK
116
LINKS
114
102
WIRELESS SWITCHING SYSTEM
108
104
SITE COMPUTER
106
109
TRANS. UNIT
TRANS. UNIT
107
DISPLAY
103
WIRELESS TELEPHONE
SITE

FIG. 1

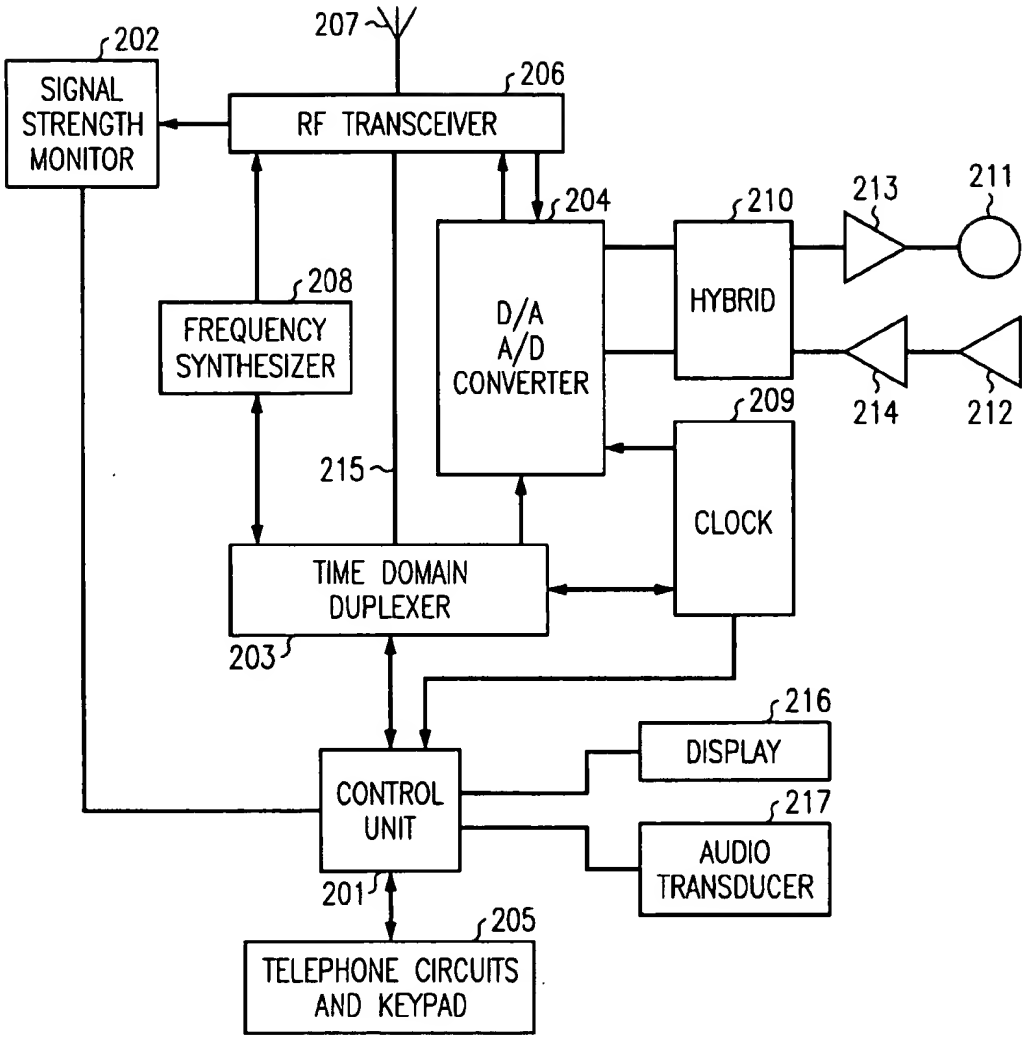

207
202
SIGNAL STRENGTH MONITOR
206
RF TRANSCEIVER
204
210
213
211
208
FREQUENCY SYNTHESIZER
D/A A/D CONVERTER
HYBRID
214
212
209
215
CLOCK
TIME DOMAIN DUPLEXER
203
216
DISPLAY
CONTROL UNIT
217
AUDIO TRANSDUCER
201
205
TELEPHONE CIRCUITS AND KEYPAD

FIG. 2

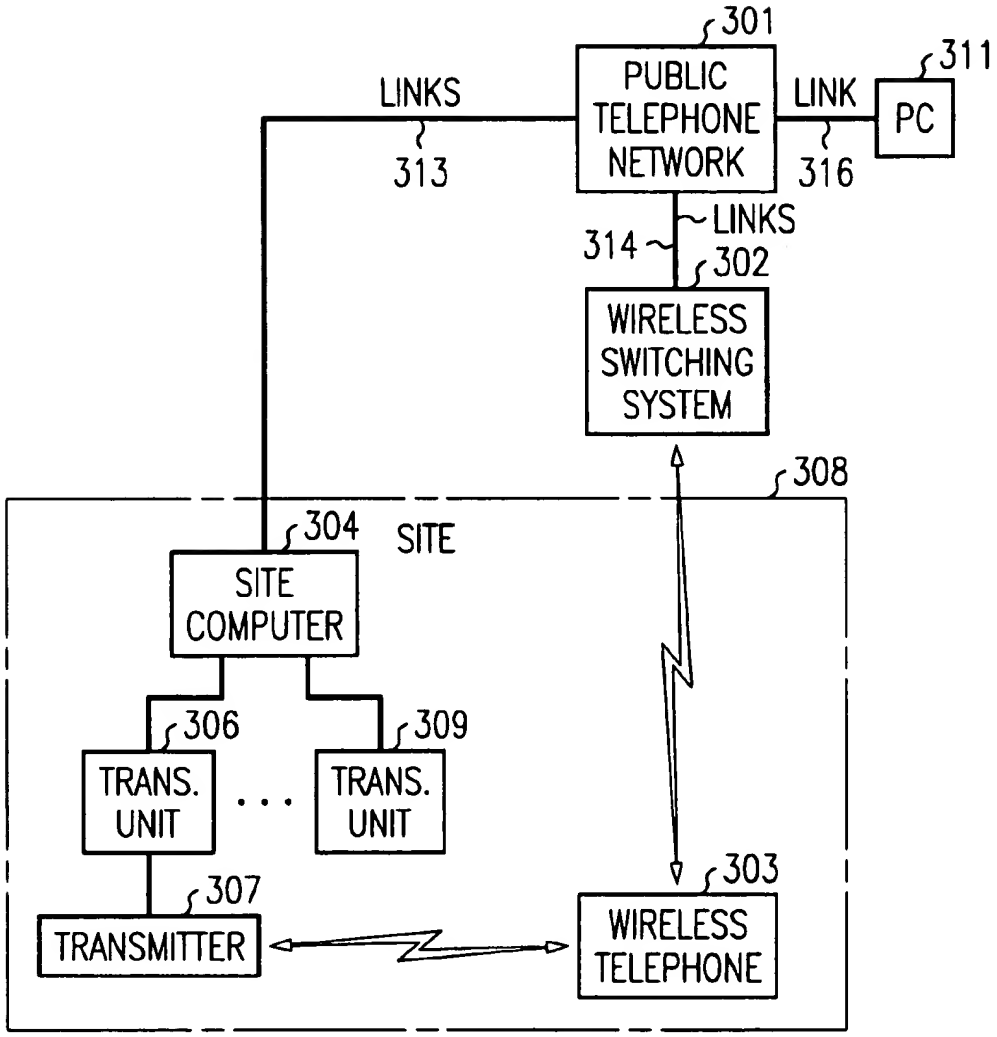

301
PUBLIC TELEPHONE NETWORK
311
PC
LINK
316
LINKS
313
LINKS
314
302
WIRELESS SWITCHING SYSTEM
308
SITE
304
SITE COMPUTER
306
309
TRANS. UNIT
TRANS. UNIT
307
TRANSMITTER
303
WIRELESS TELEPHONE

FIG. 3

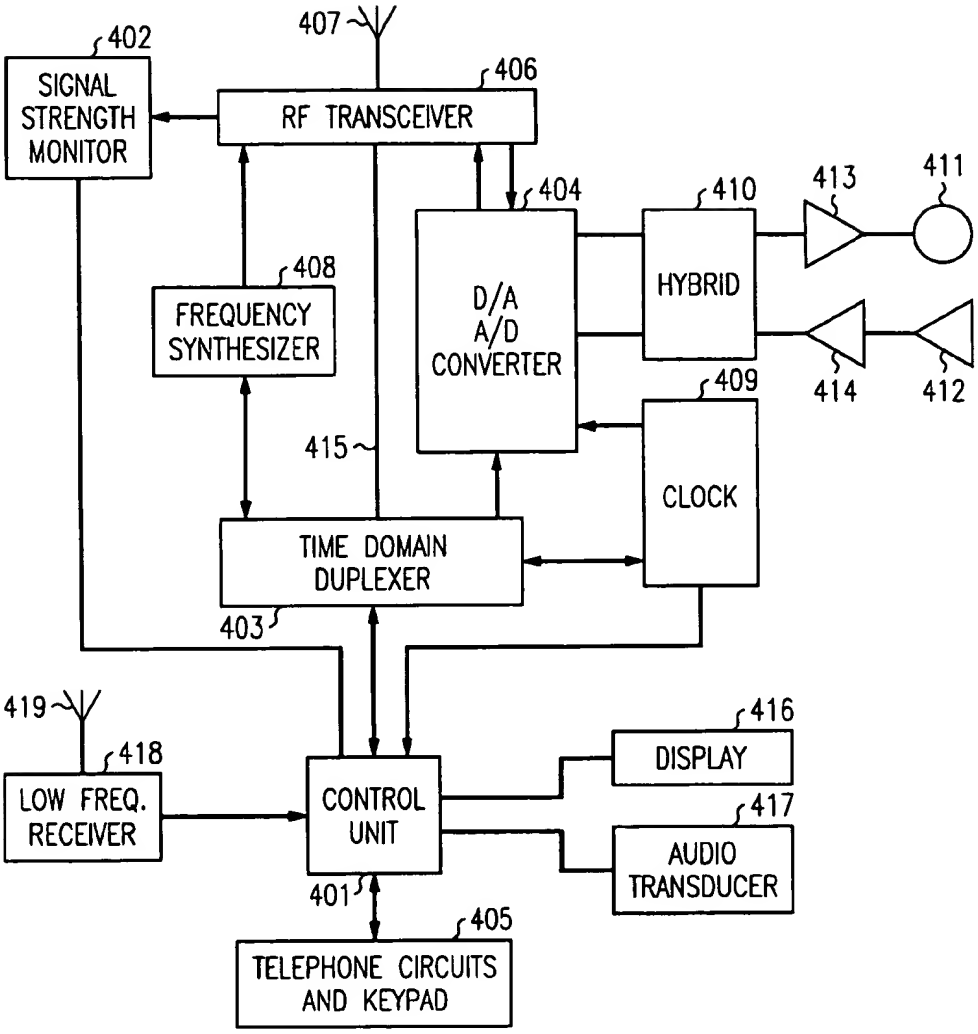
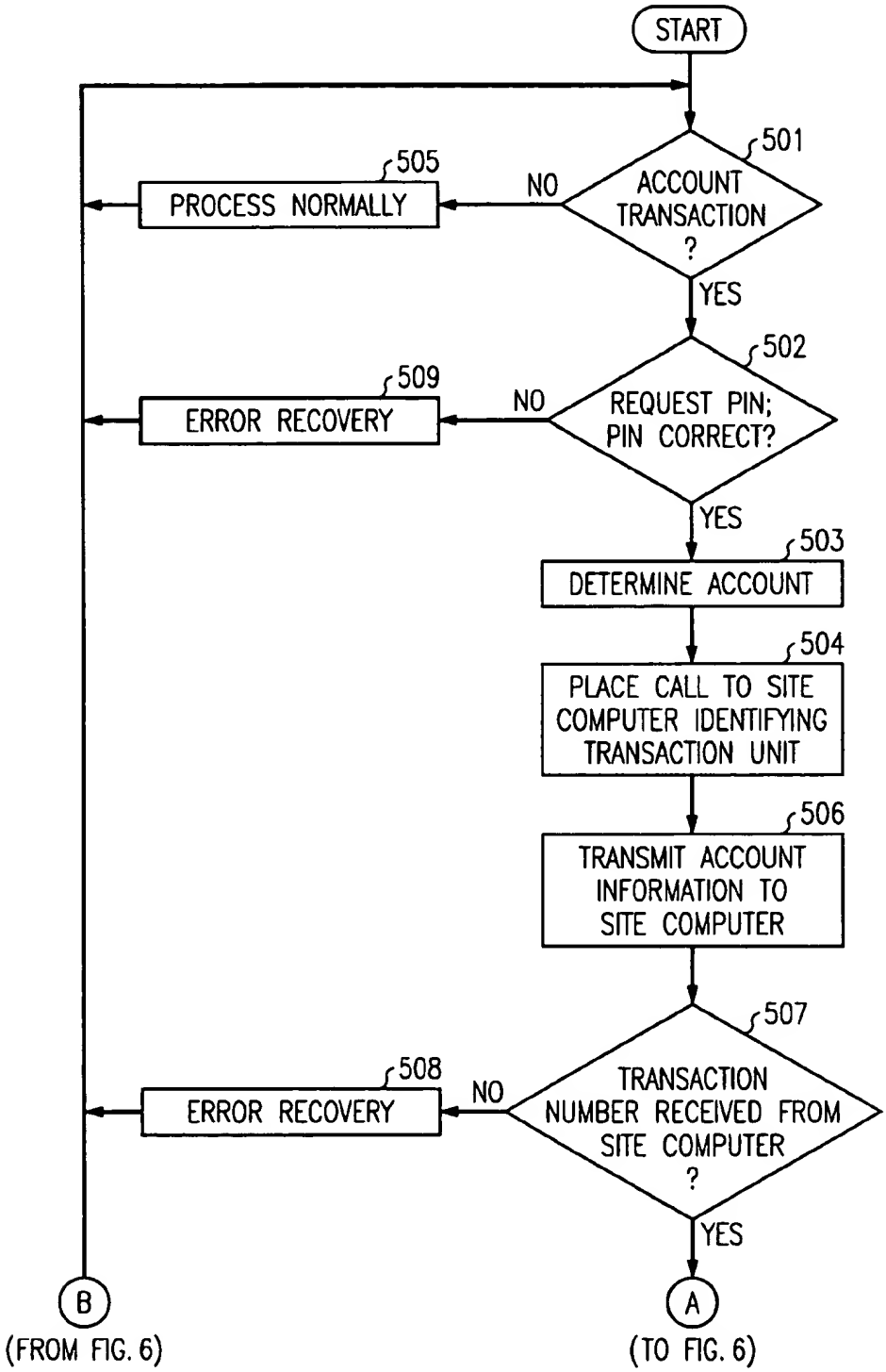

407
402
SIGNAL STRENGTH MONITOR
406
RF TRANSCEIVER
404
410
413
411
408
FREQUENCY SYNTHESIZER
D/A A/D CONVERTER
HYBRID
414
412
409
415
CLOCK
TIME DOMAIN DUPLEXER
403
419
416
418
DISPLAY
LOW FREQ. RECEIVER
CONTROL UNIT
417
AUDIO TRANSDUCER
401
405
TELEPHONE CIRCUITS AND KEYPAD

FIG. 4

FIG. 5


START
501
ACCOUNT TRANSACTION ?
NO
505
PROCESS NORMALLY
YES
502
REQUEST PIN; PIN CORRECT?
NO
509
ERROR RECOVERY
YES
503
DETERMINE ACCOUNT
504
PLACE CALL TO SITE COMPUTER IDENTIFYING TRANSACTION UNIT
506
TRANSMIT ACCOUNT INFORMATION TO SITE COMPUTER
507
TRANSACTION NUMBER RECEIVED FROM SITE COMPUTER ?
NO
508
ERROR RECOVERY
YES
B
(FROM FIG. 6)
A
(TO FIG. 6)

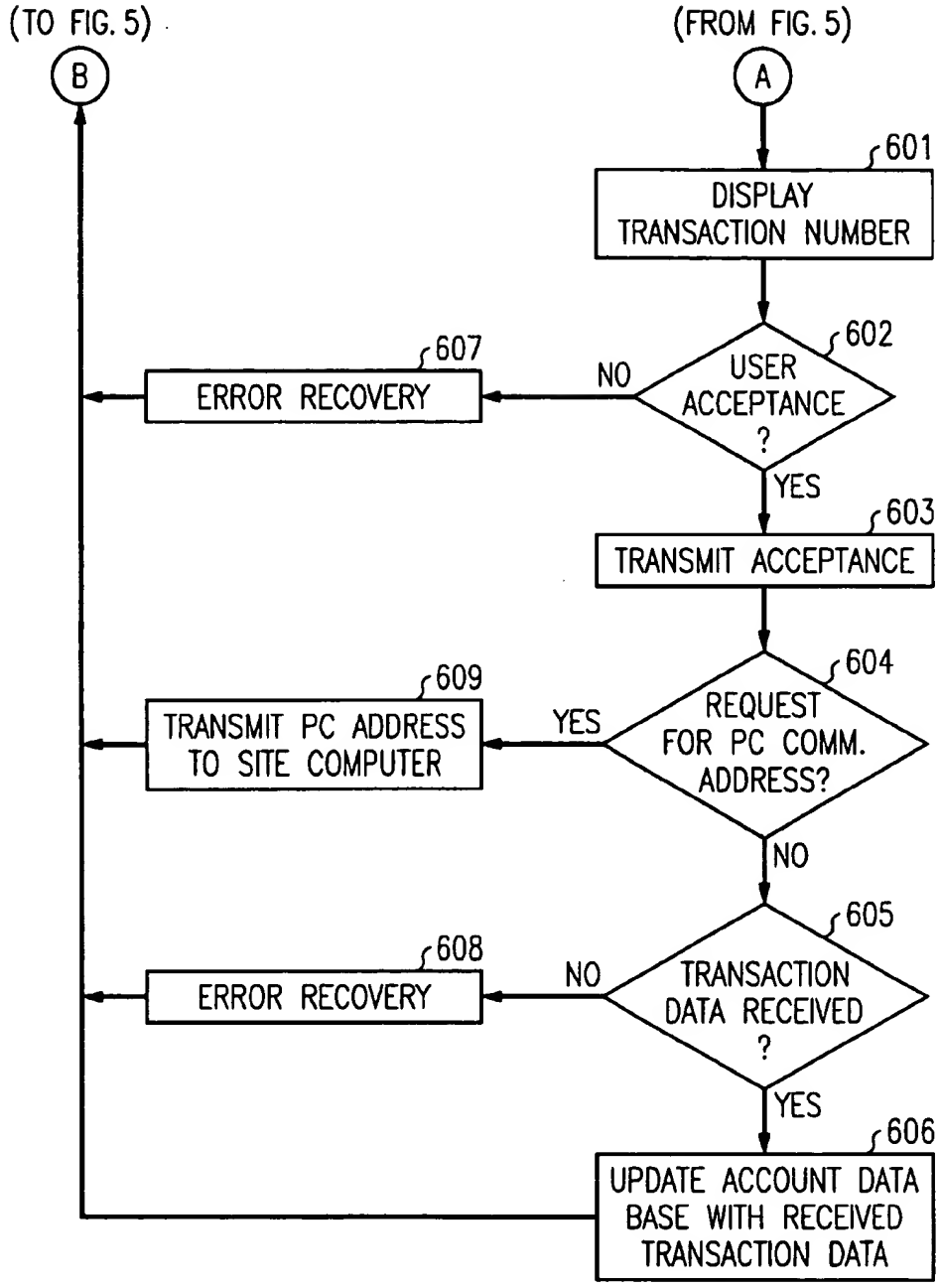
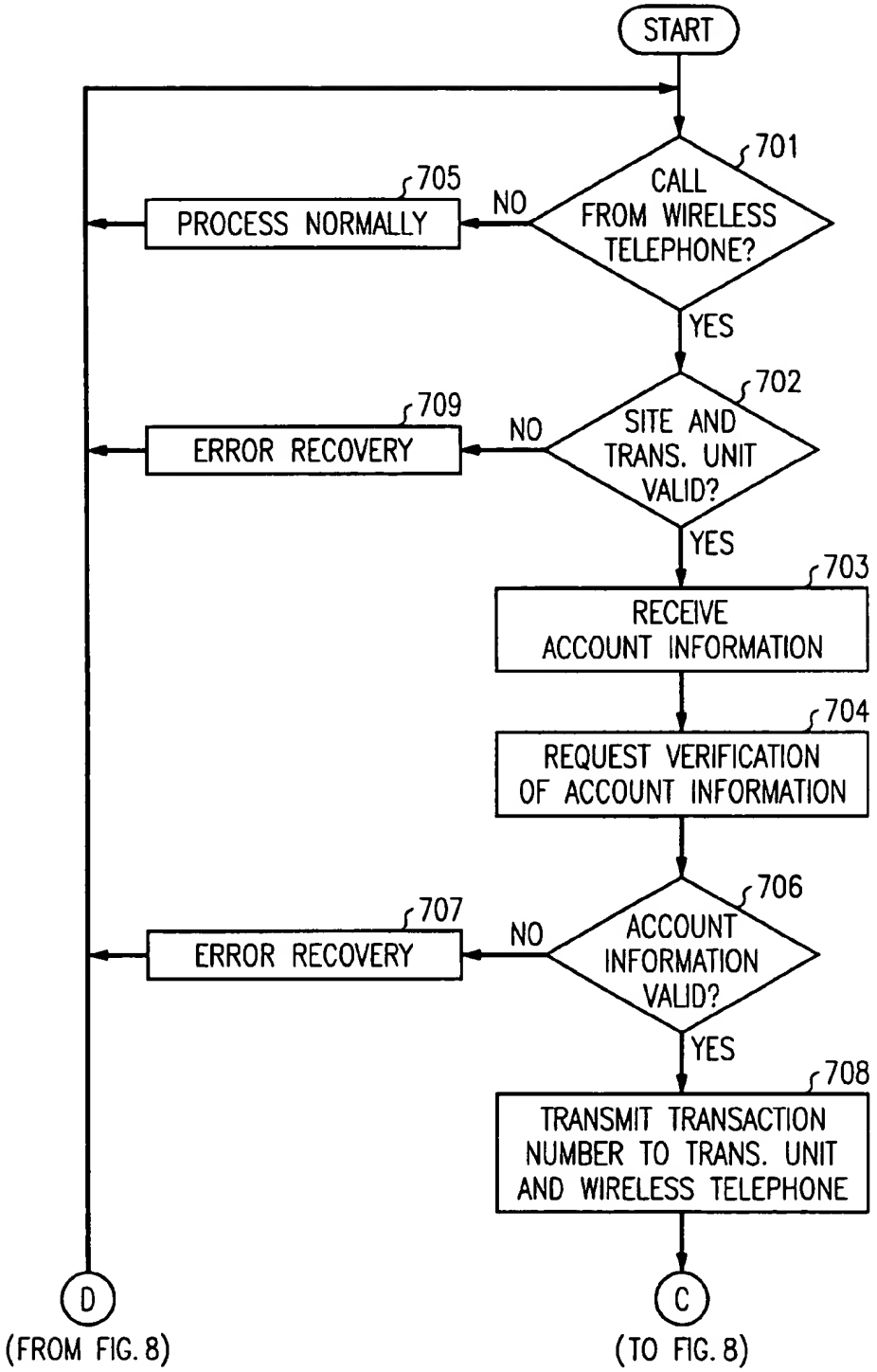

(TO FIG. 5)
B
(FROM FIG. 5)
A
601
DISPLAY TRANSACTION NUMBER
602
USER ACCEPTANCE ?
NO
607
ERROR RECOVERY
YES
603
TRANSMIT ACCEPTANCE
604
REQUEST FOR PC COMM. ADDRESS?
YES
609
TRANSMIT PC ADDRESS TO SITE COMPUTER
NO
605
TRANSACTION DATA RECEIVED ?
NO
608
ERROR RECOVERY
YES
606
UPDATE ACCOUNT DATA BASE WITH RECEIVED TRANSACTION DATA

FIG. 6

FIG. 7


START
701
CALL FROM WIRELESS TELEPHONE?
NO
705
PROCESS NORMALLY
YES
702
SITE AND TRANS. UNIT VALID?
NO
709
ERROR RECOVERY
YES
703
RECEIVE ACCOUNT INFORMATION
704
REQUEST VERIFICATION OF ACCOUNT INFORMATION
706
ACCOUNT INFORMATION VALID?
NO
707
ERROR RECOVERY
YES
708
TRANSMIT TRANSACTION NUMBER TO TRANS. UNIT AND WIRELESS TELEPHONE
D
(FROM FIG. 8)
C
(TO FIG. 8)

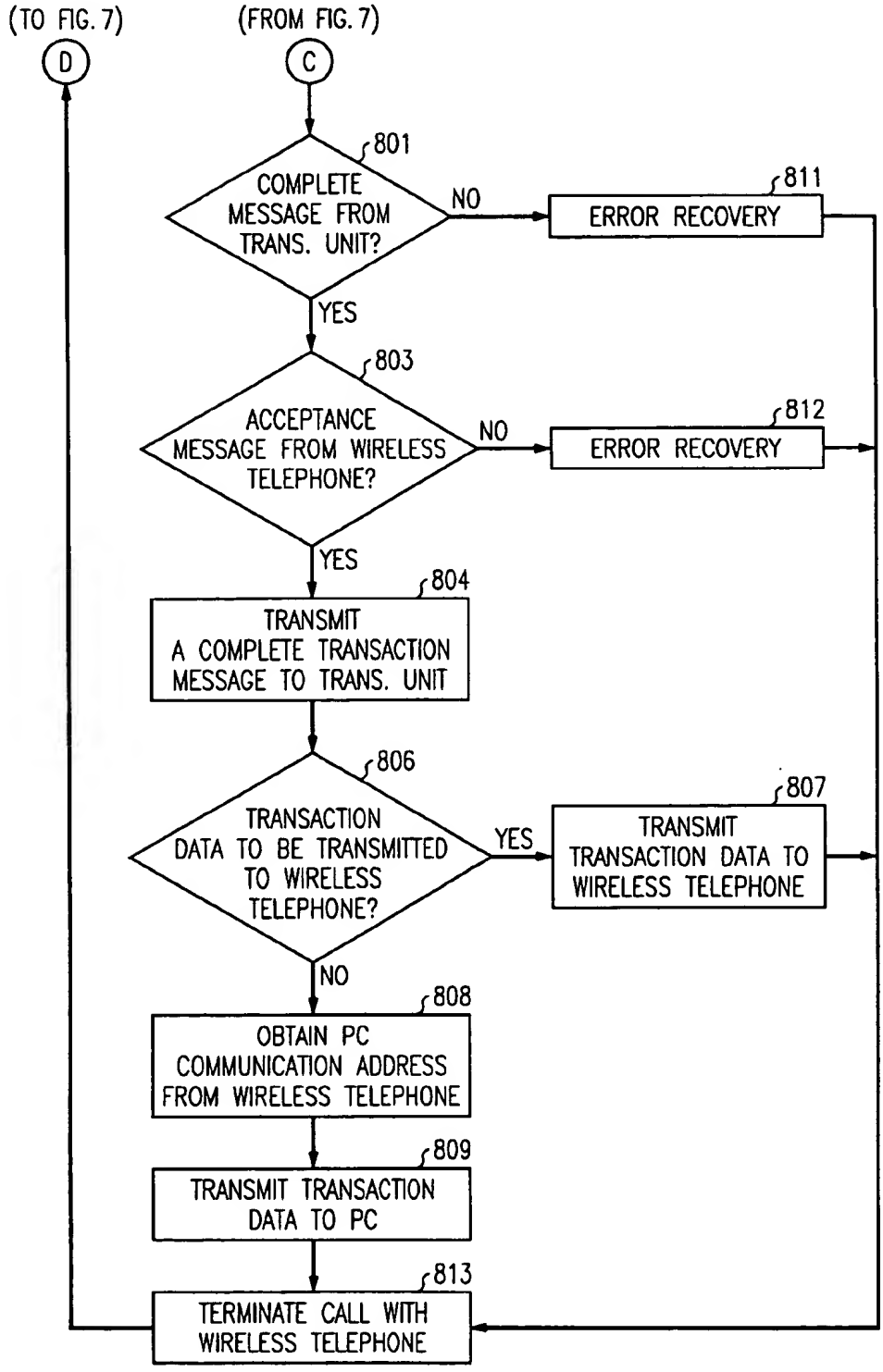

(TO FIG. 7)
D
(FROM FIG. 7)
C
801
COMPLETE MESSAGE FROM TRANS. UNIT?
NO
811
ERROR RECOVERY
YES
803
ACCEPTANCE MESSAGE FROM WIRELESS TELEPHONE?
NO
812
ERROR RECOVERY
YES
804
TRANSMIT A COMPLETE TRANSACTION MESSAGE TO TRANS. UNIT
806
TRANSACTION DATA TO BE TRANSMITTED TO WIRELESS TELEPHONE?
YES
807
TRANSMIT TRANSACTION DATA TO WIRELESS TELEPHONE
NO
808
OBTAIN PC COMMUNICATION ADDRESS FROM WIRELESS TELEPHONE
809
TRANSMIT TRANSACTION DATA TO PC
813
TERMINATE CALL WITH WIRELESS TELEPHONE

FIG. 8

FIG. 9

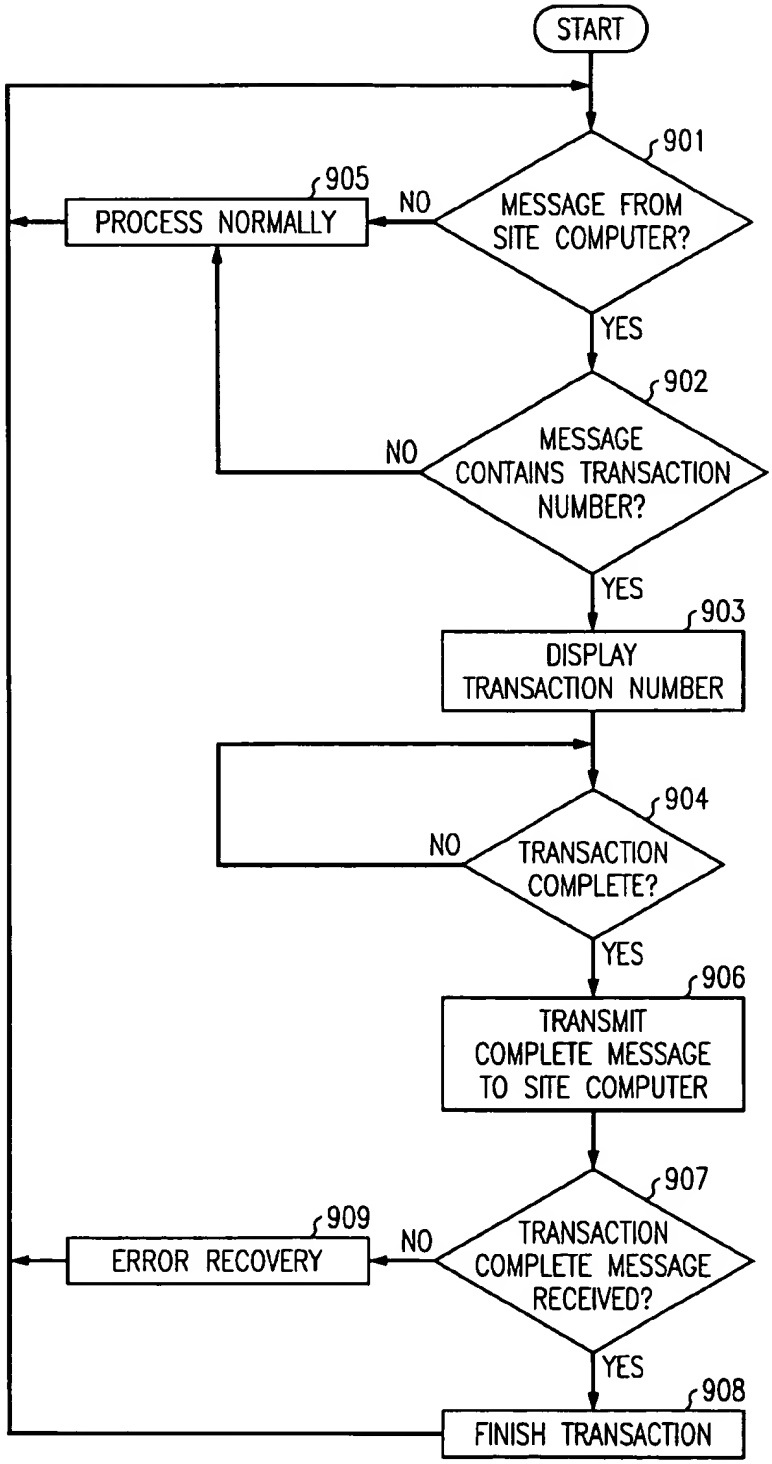
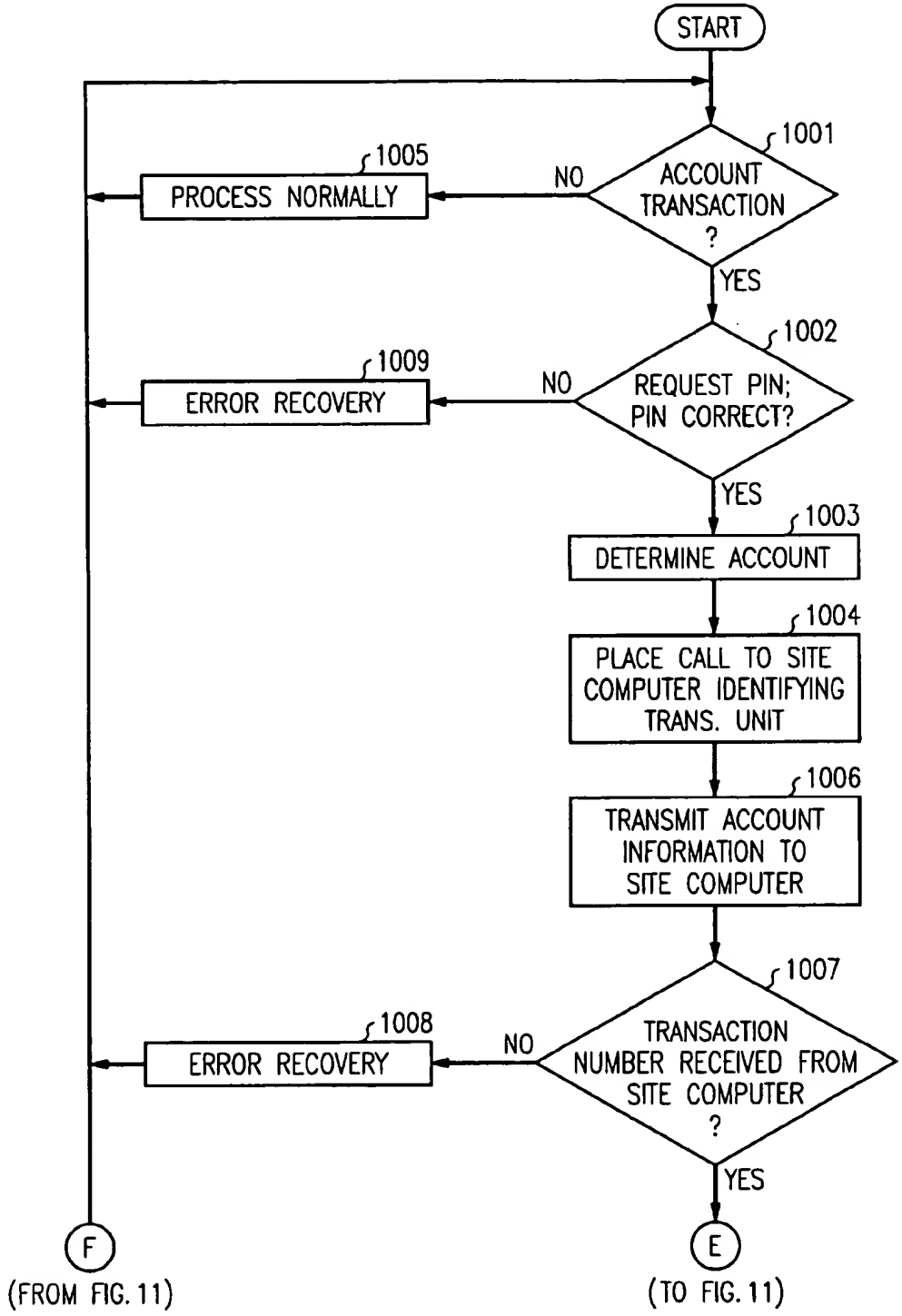

START
901
MESSAGE FROM SITE COMPUTER?
NO
905
PROCESS NORMALLY
YES
902
MESSAGE CONTAINS TRANSACTION NUMBER?
NO
YES
903
DISPLAY TRANSACTION NUMBER
904
TRANSACTION COMPLETE?
NO
YES
906
TRANSMIT COMPLETE MESSAGE TO SITE COMPUTER
907
TRANSACTION COMPLETE MESSAGE RECEIVED?
NO
909
ERROR RECOVERY
YES
908
FINISH TRANSACTION

FIG. 10


START
1001
ACCOUNT TRANSACTION ?
NO
1005
PROCESS NORMALLY
YES
1002
REQUEST PIN; PIN CORRECT?
NO
1009
ERROR RECOVERY
YES
1003
DETERMINE ACCOUNT
1004
PLACE CALL TO SITE COMPUTER IDENTIFYING TRANS. UNIT
1006
TRANSMIT ACCOUNT INFORMATION TO SITE COMPUTER
1007
TRANSACTION NUMBER RECEIVED FROM SITE COMPUTER ?
NO
1008
ERROR RECOVERY
YES
F
(FROM FIG. 11)
E
(TO FIG. 11)

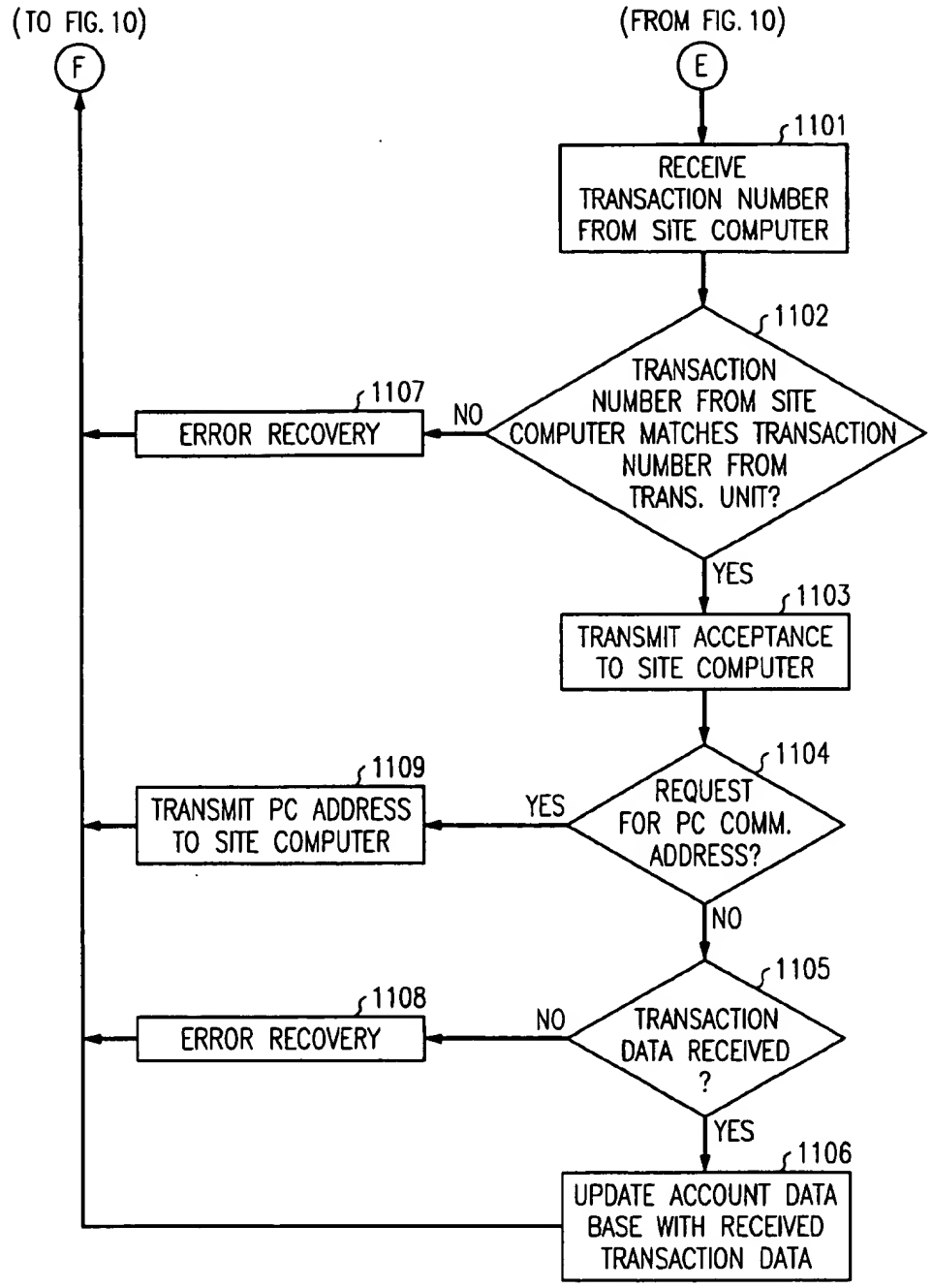
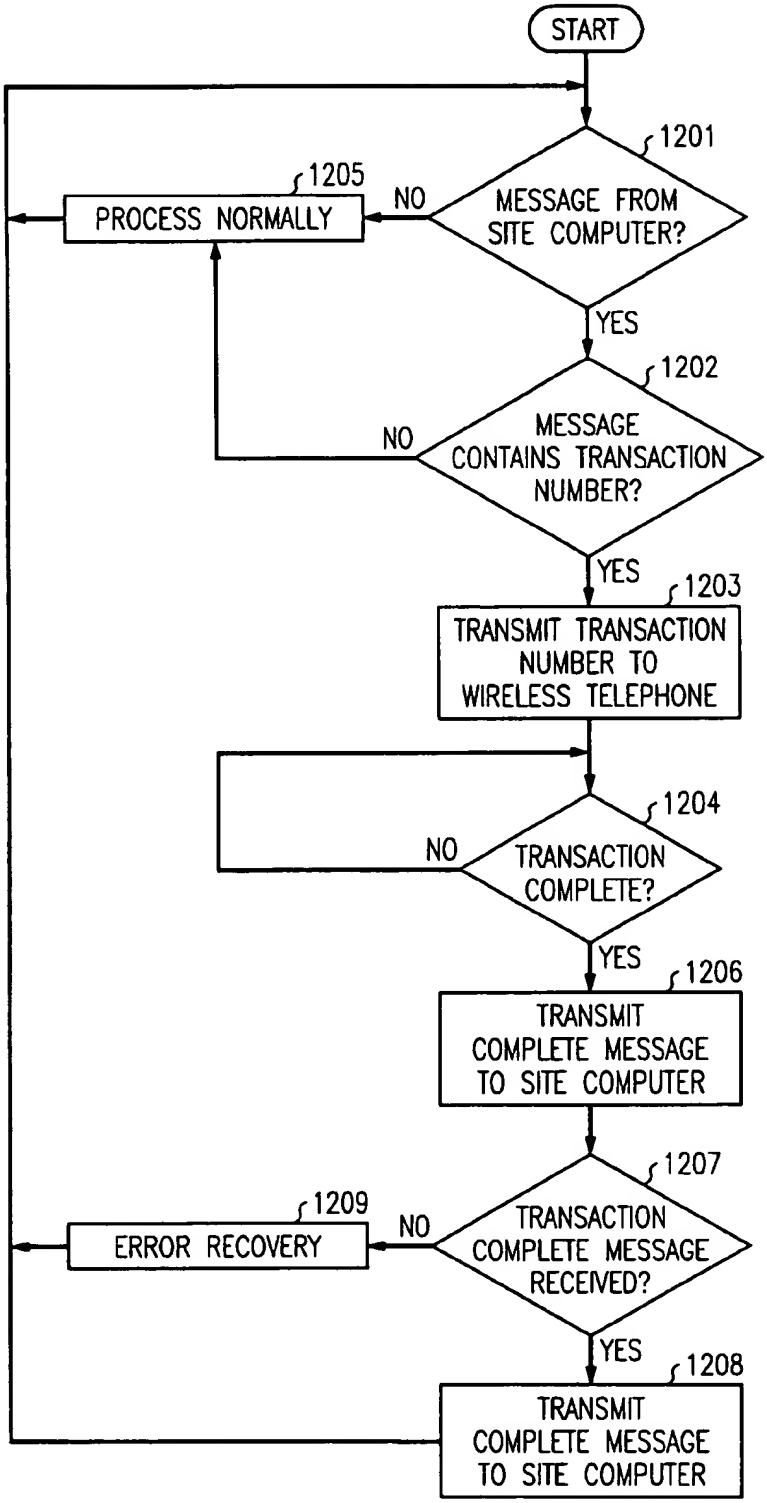

(TO FIG. 10)
F
(FROM FIG. 10)
E
1101
RECEIVE TRANSACTION NUMBER FROM SITE COMPUTER
1102
TRANSACTION NUMBER FROM SITE COMPUTER MATCHES TRANSACTION NUMBER FROM TRANS. UNIT?
NO
1107
ERROR RECOVERY
YES
1103
TRANSMIT ACCEPTANCE TO SITE COMPUTER
1104
REQUEST FOR PC COMM. ADDRESS?
YES
1109
TRANSMIT PC ADDRESS TO SITE COMPUTER
NO
1105
TRANSACTION DATA RECEIVED ?
NO
1108
ERROR RECOVERY
YES
1106
UPDATE ACCOUNT DATA BASE WITH RECEIVED TRANSACTION DATA

FIG. 11

FIG. 12


START
1201
MESSAGE FROM SITE COMPUTER?
NO
1205
PROCESS NORMALLY
YES
1202
MESSAGE CONTAINS TRANSACTION NUMBER?
NO
YES
1203
TRANSMIT TRANSACTION NUMBER TO WIRELESS TELEPHONE
1204
TRANSACTION COMPLETE?
NO
YES
1206
TRANSMIT COMPLETE MESSAGE TO SITE COMPUTER
1207
TRANSACTION COMPLETE MESSAGE RECEIVED?
NO
1209
ERROR RECOVERY
YES
1208
TRANSMIT COMPLETE MESSAGE TO SITE COMPUTER

WIRELESS TELEPHONE AS A TRANSACTION DEVICE

CROSS REFERENCE TO RELATED APPLICATIONS

G. L. Griffith, "Identification By A Central Computer Of A Wireless Telephone Functioning As A Transaction Device", U.S. patent application Ser. No. 09/127,395, filed Jul. 31, 1998, now U.S. Pat. No. 6,195,542; and

G. L. Griffith, "Interaction Of A Wireless Telephone With A Transaction Unit", U.S. patent application Ser. No. 09/127,394, filed Jul. 31, 1998, now U.S. Pat. No. 6,195,541.

These applications are being filed concurrently with this application and are assigned to the same assignee.

TECHNICAL FIELD

This invention relates to cordless, cellular, and PCS telephone systems and more particularly, to an arrangement for transferring user data via a wireless telephone.

BACKGROUND OF THE INVENTION

Within the prior art, various transaction devices have been utilized to allow individuals to perform transactions. These transactions may be to purchase merchandise or services or maybe to gain access to a secure area. Among the commonly used transaction devices is a credit card with a magnetic strip that identifies the credit card account of the individual. The standard credit card has no capability of receiving information from the transaction unit utilized to read the credit card. However, various types of smart cards do have the ability to store transactional information and to later reproduce this transaction information. For example, it is possible to have a smart card that is utilized as a standard credit card but receives information from the transactional unit defining what was purchased. In addition, the smart card can organize this information for later transmission to a personal computer via a physical link.

Similarly, other types of transactions involve such things as entering secure areas. Because of the need to preserve proprietary information, or restrict access to dangerous physical locations, many building facilities have secure areas which can only be accessed by designated people. Access to these secure areas is controlled by identification of personal features of an individual, keyed or unkeyed locks, and identification badges such as cards with magnetic strips. The cards with magnetic strips are similar to credit cards or smart cards.

The problems that exists with the prior art transaction devices fall into three major categories. First, these devices require that the transaction unit have a special interface for reading information from the device. The special reading facility may take the form of physical contact such as in a credit card application or may allow limited wireless reading of the transaction device by the transaction unit using, for example, electromagnetic transmission. However, even in the situation where the transaction device communicates information via electromagnetic transmission, the transaction unit must be specifically equipped for the particular type of electromagnetic transmission. The second problem is the proliferation of credit cards, check books, debit cards, and security cards that the average individual must carry. Third, is the amount of time required to complete the transaction. For example, when a credit card is used to purchase groceries at a supermarket. First, the groceries must be rung up; and then, the credit card entered and verified before the transaction can be completed.

SUMMARY OF THE INVENTION

The foregoing problems are solved and a technical advance is achieved by the utilization of a wireless telephone to function as a transaction device. In a first embodiment, the wireless telephone places a call to a site computer controlling a transaction unit. For example, the transaction unit may be a cash register at a supermarket. The wireless telephone then transfers to the transaction unit account information specifying the type of account against which the transaction is to be billed and identification of that transaction. The site computer controlling the transaction unit responds with a transaction number. The user of the wireless telephone then confirms the transaction when the correct transaction number is displayed on the transaction unit. After the transaction is completed, the site computer controlling the transaction unit transmits the data defining the transaction to the wireless telephone which stores this information in a database associated with the account against which the transaction was charged. Advantageously, before placing the call to the site computer, the wireless telephone requests personal identification information from the user to assure that the user is authorized to make the transaction. Advantageously, within a large facility such as a supermarket, only the site computer controlling the cash register needs to have a communication link over which the wireless telephone can communicate account data.

In a second embodiment, the transaction number is not visually displayed but rather is transmitted over a second transmission media to the wireless telephone confirming that the correct transaction is taking place.

Advantageously, by utilizing the transaction number, the wireless telephone can transmit the account information to the site computer well in advance of the actual financial transaction taking place. For example, within a supermarket, the user could request that the wireless telephone transmit the account information while the user was standing in line for the cash register. In such a situation, the user would have to specify the cash register to the wireless telephone.

Advantageously, the wireless telephone can place a call to a personal computer of the user and transfer the account information to the personal computer. This alleviates the need of the user physically attaching the wireless telephone to the personal computer. It is assumed that the personal computer performs the necessary financial and database functions on account information as required by the user. Also, the wireless telephone can request that the site computer transfer the account data to the personal computer via a communication link.

These and other features and advantages of the invention will become apparent from the following description of illustrative embodiments of the invention considered together with the drawing.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a block diagram of a system for performing the first embodiment;

FIG. 2 is a block diagram of a wireless telephone for utilization in the first embodiment;

FIG. 3 illustrates in block diagram form, a system including the second embodiment;

FIG. 4 illustrates, in block diagram form, a wireless telephone for utilization in the second embodiment;

FIGS. 5 and 6, illustrate in flowchart form, steps performed by a wireless telephone in the first embodiment of the invention;

FIGS. 7 and 8 illustrate, in flowchart form, steps performed by a site computer in the first embodiment of the invention;

FIG. 9 illustrates, in flowchart form, steps performed by a transaction unit in the first embodiment of the invention;

FIGS. 10 and 11 illustrate, in flowchart form, steps performed by a wireless telephone in a second embodiment of the invention;

FIG. 12 illustrates, in flowchart form, steps performed by a transaction unit in the second embodiment of the invention;

DETAILED DESCRIPTION

FIG. 1 illustrates a system for implementing the first embodiment of the invention. In the first embodiment of the invention, site **108** has site computer **104** that controls transaction units **106–109**. Attached to each transaction unit is a visual display such as display **107** which is connected to transaction unit **106**. If site **108** is a supermarket, the transaction units are cash registers, and site computer **104** is the store computer that controls the cash registers. Wireless telephone **103** interconnects via a wireless communication path to wireless switching system **102** that is connected via links **114** to public telephone network **101**. The user of wireless telephone **103** has personal computer (PC) **111** at the user's residence. PC **111** is interconnected via a modem and link **116** to public telephone network **101**. Site computer **104** is interconnected via modems and links **113** to public telephone network **101**.

To understand the operation of the first embodiment, consider the following example. Site **108** is a supermarket; and the user of wireless telephone **103** has selected merchandise and is waiting in line to pay for this merchandise at transaction unit (cash register) **106**. The user initiates a call to site computer **104** via wireless switching system **102**, links **114**, public telephone network **111**, and links **113**. Advantageously, this call may be simply a data call. Before setting up the call, wireless telephone **103** verifies that the user has permission to purchase merchandise by requesting and verifying personal information about the user. The personal information can consist of a personal identification number (PIN) or voice recognition techniques. After the identity of the user has been verified, wireless telephone **103** establishes the call to site computer **104**. Once the call is connected, wireless telephone **103** transmits to site computer **104** identification of transaction unit **106** and account information defining the type of account that wireless telephone **103** wishes the merchandise charged against. merchandise

Site computer **104** then verifies the account information. If a credit card number is being utilized, site computer **104** will contact a credit card database to verify that the number is valid. These steps can be performed while the user is in line since no interaction is required with transaction unit **106**. Site computer **104** transmits to wireless telephone **103** a transaction number that is used to verify the transaction. Wireless telephone **103** displays the transaction number. Site computer **104** also transmits to transaction unit **106** the transaction number which is displayed on display **107**. If the displayed transaction number is identical to the transaction number received by wireless telephone **103**, the user accepts the transaction. Wireless telephone **103** then transmits acceptance to site computer **104** that in turn verifies this confirmation with transaction unit **106**.

Site computer **104** then transmits to wireless telephone **103** transaction data that is stored internally by wireless telephone **103** for later use. Advantageously, the transaction data consists of an itemized list of items by price. Wireless telephone **103** is responsive to the transaction data to either store it internally or to transmit it via wireless switching system **102**, links **114**, public telephone network **101**, and link **116** to PC **111**. Advantageously, this transfer can occur at a later point in time. U.S. Pat. No. 5,559,313 discloses how such transaction data could be utilized and processed by PC **111**.

Wireless telephone **103** is advantageously illustrated in greater detail in FIG. **2**. Wireless set **103** implements a wireless protocol that allows wireless telephone **103** to establish a wireless signal link with wireless switching system **102**. One air interface that can be used is the Japanese PHS protocol as set forth in "User-Network Interface and Inter-Network Interface Standards for PHS", the Telecommunication Technology Committee, 1995, and "Personal Handy Phone System RCR Standard", Version 1, RCR STD-28, Dec. 20, 1993. The message set of the PHS protocol is similar to the ISDN message set. Overall control of the wireless telephone is provided by control unit **201**. Units **202, 203, 206, 207, 208**, and **209** provide the RF communication capabilities for the wireless telephone. Elements **204, 210**, and **211–214** provide the audio information received and transmitted to the user; whereas, elements **216–218** and **205** provide the basic user interface. In response to receiving a transaction number via units **206, 208**, and **203**, control unit **201** displays the transaction number on display **216**.

FIG. **3** illustrates a system for performing the second embodiment of the invention. The operation of the second embodiment is similar to that of the first embodiment with the exception that the transaction number is transmitted via a second transmission medium distinct from the transmission medium of wireless switching system **302** to the wireless telephone **303** by the transaction unit. The transmission of the transaction number via the second medium frees the user from having to do the visual comparison of the transaction number.

Wireless telephone **303** is advantageously illustrated in greater detail in FIG. **4**. Wireless set **303** implements a wireless protocol that allows wireless telephone **303** to establish a wireless signal link with wireless switching system **302**. One air interface that can be used is the Japanese PHS protocol as set forth in "User-Network Interface and Inter-Network Interface Standards for PHS", the Telecommunication Technology Committee, 1995, and "Personal Handy Phone System RCR Standard", Version 1, RCR STD-28, Dec. 20, 1993. The message set of the PHS protocol is similar to the ISDN message set. Overall control of the wireless telephone is provided by control unit **401**. Units **402, 403, 406, 407, 408**, and **409** provide the RF communication capabilities for the wireless telephone. Elements **404, 410**, and **411–414** provide the audio information received and transmitted to the user; whereas, elements **416–418** and **405** provide the basic user interface.

FIGS. **5–8** illustrate, in flowchart form, steps performed in implementing the first embodiment of the invention. FIGS. **5** and **6** illustrate steps performed by wireless telephone **103** of FIGS. **1** and **2**. After the operations are started, decision block **501** of FIG. **5** determines if the user is requesting an account transaction. If the answer is no, block **505** performs normal processing before returning control back to decision block **501**.

If the answer in decision block **501** is yes, decision block **502** requests the PIN or other personal identification infor-

mation from the user and verifies that the PIN is correct. If the answer is no, control is transferred to block **509** which performs error recovery before transferring control back to decision block **501**. If the answer in decision block **502** is yes, control is transferred to block **503** which determines what type of an account the user wishes to use. Block **504** then places a call to site computer **104** and identifies the transaction unit. After the call has been completed to site computer **104**, block **506** transmits the account information to site computer **104** before transferring control to decision block **507**. Decision block **507** waits for the transaction number from site computer **104**. If the transaction number is not received, control is transferred to block **508** which performs error recovery before transferring control back to decision block **501**. If the transaction number is received from site computer **104**, control is transferred to block **601** of FIG. **6**.

Block **601** displays the transaction number utilizing a display such as a display **107** of FIG. **1** before transferring control to decision block **602**. The later decision block waits for the user's acceptance. If the user does not accept, control is transferred to block **607** which performs error recovery before transferring control back to decision block **501** of FIG. **5**. If the user's acceptance is received, control is transferred to block **603** which transmits the acceptance to site computer **104**. Decision block **604** then awaits for the transaction data to be received from the site computer. If the transaction data is not received, block **608** performs error recovery before transferring control back to decision block **501** of FIG. **5**. If the transaction data is received by decision block **604**, control is transferred to block **606** which updates the account database with the received transaction data. As previously noted, this updating of the account database can consist of internally storing the transaction data or transmitting it to the PC of the user by placing a telephone call to the PC.

FIGS. **7** and **8** illustrate the steps performed by site computer **104** FIG. **1**. Once operation has started, decision block **701** determines if a call from a wireless telephone has been received. If the answer is no, block **705** performs normal processing before returning control back to decision block **701**. If the answer is yes, decision block **702** determines if the site and transaction unit identified in the message from the wireless telephone are valid. If the answer is no in decision block **702**, block **709** performs error recovery before transferring control back to decision block **701**. If the answer is yes in decision block **702**, block **703** receives the account information transmitted by the wireless telephone. Block **704** then verifies the account information. For a credit card number, block **704** contacts the credit card database, not illustrated in FIG. **1**, to obtain verification of the credit card number. Decision block **706** then determines if the account information verified in block **704** is valid. If the answer is no, block **707** performs error recovery before transferring control back to decision block **701**. If the answer in decision block **706** is yes, site computer **104** determines a transaction number and transmits that transaction number to the transaction unit and the wireless telephone before transferring control to decision block **801** of FIG. **8**.

Decision block **801** determines when a complete message is received from the transaction unit. The complete message indicates that the transaction has been completed at the transaction unit. If the answer is no in decision block **801**, block **811** performs error recovery before transferring control to block **813**. Block **813** terminates the call with the wireless telephone before transferring control back to decision block **701** of FIG. **7**. If the answer is yes in decision block **801**, control is transferred to decision block **803** which determines if an acceptance message has been received from the wireless telephone. If no acceptance message has been received, block **812** performs error recovery before transferring control to block **813**. If an acceptance message has been received from the wireless telephone, block **804** transmits to the transaction unit a complete transaction message that causes the transaction unit to finish the transaction.

Then, block **804** transfers control to decision block **806**. Decision block **806** determines if the transaction data gathered during the transaction are to be transmitted to the wireless telephone or to a PC owned by the user of the wireless telephone. If the transaction data is to be transmitted directly to the wireless telephone, block **807** performs this operation before transferring control to block **813**. If the answer in decision block **806** is no, block **808** obtains the communication address of the PC from the wireless telephone. This communication address may be a telephone number so that a data call may be set up via a modem connected to the PC. The transmission of the transaction data to the PC is performed by block **809**. After execution of block **809**, control is transferred to block **813**.

FIG. **9** illustrates the steps performed by a transaction unit. For the sake of description, the transaction unit is assumed to be transaction unit **106**. Once operation has been started, decision block **901** determines if a message from the site computer was received. If the answer is yes, decision block **902** determines if a transaction number is included in the message. The presence of a transaction number indicates that the message involves an operation with a wireless telephone. If the answer in either decision block **901** or **902** is no, control is transferred to block **905** which performs normal processing before returning control back to decision block **901**. If the answer is yes in decision block **902**, block **903** displays the transaction number on display **107** before transferring control to decision block **904**. The latter decision block determines if the transaction has been completed at the transaction unit. If the answer is no, decision block **904** continues to wait. If the answer is yes, block **906** transmits a complete message to site computer **104** before transferring control to decision block **907**. Decision block **907** waits until a transaction complete message is received from site computer **104**. If a transaction complete message is not received, block **909** performs error recovery before transferring control back to decision block **901**. If the answer is yes in decision block **907**, block **908** finishes the transaction before transferring control back to decision block **901**.

FIGS. **10–12** illustrate the steps performed in implementing the second embodiment of the invention. FIGS. **10** and **11** illustrate steps performed by wireless telephone **303** of FIGS. **3** and **4**. After the operations are started, decision block **1001** of FIG. **10** determines if the user is requesting an account transaction. If the answer is no, block **1005** performs normal processing before returning control back to decision block **1001**.

If the answer in decision block **1001** is yes, decision block **1002** requests the PIN or other personal identification information from the user and verifies that the PIN is correct. If the answer is no, control is transferred to block **1009** which performs error recovery before transferring control back to decision block **1001**. If the answer in decision block **1002** is yes, control is transferred to block **1003** which determines what type of an account the user wishes to use. Block **1004** then places a call to site computer **304** and identifies the transaction unit. After the call has been completed to site computer **304**, block **1006** transmits the account information

to site computer **304** before transferring control to decision block **1007**. Decision block **1007** waits for the transaction number from site computer **304**. If the transaction number is not received, control is transferred to block **1008** which performs error recovery before transferring control back to decision block **1001**. If the transaction number is received from site computer **304**, control is transferred to block **1101** of FIG. **11**.

Block **1101** receives the transaction number from site computer **304**. Decision block **1102** determines if the transaction number from site computer **304** matches the transaction number being transmitted from the transaction unit. The comparison in decision block **1102** is performed over a predefined amount of time. If after a predefined amount of time there is not a match, block **1107** performs error recovery before transferring control to decision block **1001** of FIG. **10**. If the answer is yes in decision block **1102**, block **1103** transmits an acceptance message to site computer **304**. Next, decision block **1104** determines if a request has been received for the communication address of the user. If the answer is yes, block **1109** transmits the PC communication address to site computer **304**. If the answer is no in decision block **1104**, decision block **1105** determines if transaction data has been received from site computer **304**. If the answer is yes, block **1106** updates the account database with the received transaction data before returning control to decision block **1001** of FIG. **10**. If the answer is no in decision block **1105**, block **1108** performs an error recovery before transferring control to decision block **1001** of FIG. **10**. Block **1106** updates the account database with the received transaction data. As previously noted, this updating of the account database can consist of internally storing the transaction data or transmitting it to the PC of the user by placing a telephone call to the PC.

FIG. **12** illustrates the steps performed by a transaction unit. For the sake of description, the transaction unit is assumed to be transaction unit **306**. Once operation has been started, decision block **1201** determines if a message from the site computer was received. If the answer is yes, decision block **1202** determines if a transaction number is included in the message. The presence of a transaction number indicates that the message involves an operation with a wireless telephone. If the answer in either decision block **1201** or **1202** is no, control is transferred to block **1205** which performs normal processing before returning control back to decision block **1201**. If the answer is yes in decision block **1202**, block **1203** continuously transmits the transaction number via transmitter **307** before transferring control to decision block **1204**. The latter decision block determines if the transaction has been completed at the transaction unit. If the answer is no, decision block **1204** continues to wait. If the answer is yes, block **1206** transmits a complete message to site computer **304** before transferring control to decision block **1207**. Decision block **1207** waits until a transaction complete message is received from site computer **304**. If a transaction complete message is not received, block **1209** performs error recovery before transferring control back to decision block **1201**. If the answer is yes in decision block **1207**, block **1208** finishes the transaction before tranferring control back to decision block **1201**.

Of course, various changes and modifications to the illustrative embodiments described above will be apparent to those skilled in the art. Such changes and modifications can be made without departing from the spirit and the scope of the invention and without diminishing its attendant advantages. It is therefore intended that such changes and modifications be covered by the following claims.

What is claimed is:

1. A method for conducting transactions by a wireless telephone with a plurality of transaction units controlled by a site computer, comprising the steps of:

establishing a telecommunication call to the site computer by the wireless telephone upon the wireless telephone preparing to engage in a transaction with one of the plurality of the transaction units;

transmitting a transaction number to the wireless telephone and the one of transaction units by site computer; and

accepting the transaction by the wireless telephone upon the transaction number received by the wireless telephone being identical to that received by the one of transaction units.

2. An apparatus for performing the method of claim **1**.

3. The method of claim **1** further comprises the step of verifying personal identification information of a user of the wireless telephone by the wireless telephone before the step of establishing is performed.

4. An apparatus for performing the method of claim **3**.

5. The method of claim **3** further comprises the steps of transmitting account information to the site computer by the wireless telephone; and

verifying the account information by the site computer.

6. An apparatus for performing the method of claim **5**.

7. The method of claim **5** further comprises the step of retransmitting by the one of the transaction units the received transaction number from the site computer to the wireless telephone.

8. An apparatus for performing the method of claim **7**.

9. The method of claim **7** wherein the step of accepting comprises the step of transmitting an acceptance message to site computer by wireless telephone in response to the transaction number received from the one of the transaction units being identical to the received transaction number from the site computer.

10. An apparatus for performing the method of claim **9**.

11. The method of claim **9** wherein a remote personal computer is used by the user and the method further comprises the step of transmitting the transaction data to the personal computer by the site computer in response to the acceptance message.

12. An apparatus for performing the method of claim **11**.

13. The method of claim **9** further comprises the step of transmitting transaction data to wireless telephone in response to the acceptance message by the site computer where the transaction data specifies information about the transaction.

14. An apparatus for performing the method of claim **13**.

15. The method of claim **13** wherein a remote personal computer is used by the user and the method further comprises the step of transmitting the transaction data to the personal computer by the wireless telephone.

16. An apparatus for performing the method of claim **15**.

17. The method of claim **5** further comprises the step of displaying the received transaction number by the one of the transaction units;

displaying the received transaction number to the user of wireless telephone by the wireless telephone; and

the step of accepting comprises the step of transmitting an acceptance message to site computer by wireless telephone in response to an action by the user of the wireless telephone confirming that the received transaction number displayed by the one of the transaction units is identical to the received transaction number displayed by the wireless telephone.

18. An apparatus for performing the method of claim 17.

19. The method of claim 17 wherein a remote personal computer is used by the user and the method further comprises the step of transmitting the transaction data to the personal computer by the site computer in response to the acceptance message.

20. An apparatus for performing the method of claim 19.

21. The method of claim 17 further comprises the step of transmitting transaction data to the wireless telephone in response to the acceptance message by the site computer where the transaction data specifies information about the transaction.

22. An apparatus for performing the method of claim 21.

23. The method of claim 21 wherein a remote personal computer is used by the user and the method further comprises the step of transmitting the transaction data to the personal computer by the wireless telephone.

24. An apparatus for performing the method of claim 23.

25. A method for allowing transactions by a site computer to be conducted by a wireless telephone with a plurality of transaction units controlled by the site computer, comprising the steps of:

receiving a telecommunication call from the wireless telephone by the site computer upon the wireless telephone preparing to engage in a transaction with one of the plurality of the transaction units;

transmitting a transaction number to the wireless telephone and the one of transaction units by site computer for use by the wireless telephone and the one of transaction units to confirm the transaction; and

processing the transaction by the site computer upon receiving a message from the wireless telephone that the transaction number received by the wireless telephone is identical to that received by the one of transaction units.

26. An apparatus for performing the method of claim 25.

27. The method of claim 25 further comprises the steps of receiving account information from the wireless telephone; and

verifying the account information by the site computer.

28. An apparatus for performing the method of claim 27.

29. The method of claim 27 wherein the step of processing comprises the step of receiving an acceptance message from wireless telephone transmitted in response to the received transaction number of the one of the transaction units is identical to the received transaction number of the wireless telephone.

30. An apparatus for performing the method of claim 29.

31. The method of claim 29 further comprises the step of transmitting transaction data to the wireless telephone in response to the acceptance message where the transaction data specifies information about the transaction.

32. An apparatus for performing the method of claim 31.

33. The method of claim 29 wherein a remote personal computer is used by the user and the method further comprises the step of transmitting the transaction data to the personal computer by the site computer in response to the acceptance message.

34. An apparatus for performing the method of claim 33.

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